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TORREYA

June, 1911

Vol. 11

No. 6

A NOMENCLATORIAL PROBLEM WITH A DESCRIPTION OF A NEW FORM, PETALOSTEMUM PURPUREUM F. ARENARIUM*

BY FRANK C. GATES

Individual plants of a given species occupying different habitats may become considerably modified, giving rise to variation among themselves. This is usually conceded to be an adaptation, induced by the local habitat, in the individual plant. To a taxonomist, the resulting form is but an extreme variation from the type and no general advantage is secured in giving it a name. A specific name is inapplicable, as complete series of intergrading forms are frequently present. To an ecologist, however, the matter stands in a very different light. He is dealing primarily with plants in their habitats. The ability of a single species to live in more than one habitat may often be an important factor in determining the relationships of the vegetation.

The usual form of a species tends to grow in the preferred habitat of that species. Widely varying forms are likely to be results of associational succession. The forms are consequently given the terms relics or invaders according to their position in the genetic series of succession. The form of the relic species changes because some of the external conditions have been changed by the successful invasion of an association. The invasion of the forest upon the prairie furnishes many excellent examples through the persistence of a number of prairie species

* Contributions from the Botanical Laboratories of the University of Michigan No. 124.

Submitted with the spelling in accordance with recommendations of the Simplified Spelling Board, and changed to conform to the editorial policy of TORREYA.—N. T.

[No. 5, Vol. 11, of TORREYA, comprising pp. 101-124, was issued 17 May 1911.]

in spite of the unaccustomed shade. Relic species are frequently very tenacious of life and will struggle for a long time before they succumb. They are usually able to reproduce vegetatively.

The status of invaders is only a little different. The invader must be able to cope advantageously with the new conditions from the beginning, in order to maintain its life. This may induce extreme variation, which is not mutation because there are usually all stages of transition from the usual form to the new form. Furthermore, when the succeeding association becomes dominant in an area in which the extreme form originally developed, only usual forms occur. Conclusive evidence is at hand to show that the vegetative structures of a perennial plant,

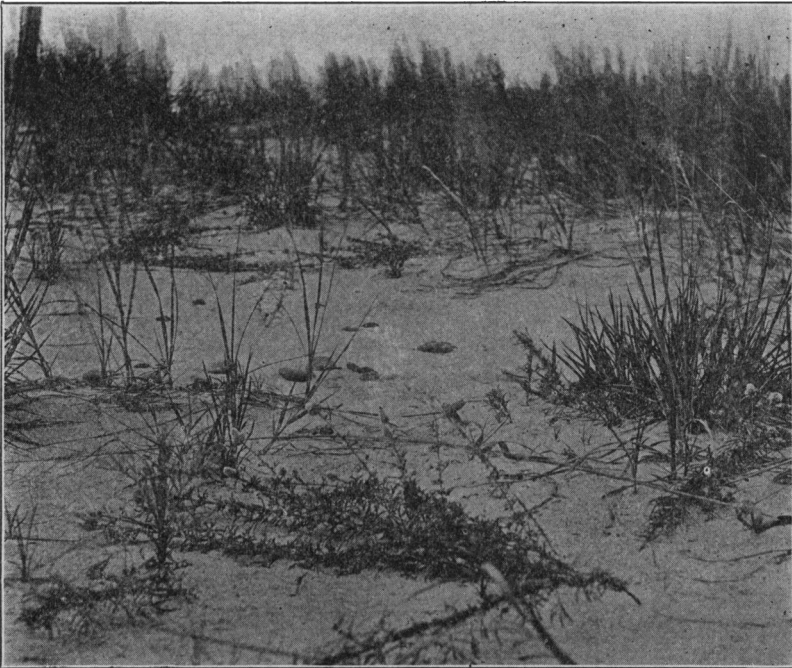


FIG. 1. *Petalostemum purpureum* f. *arenarium* growing among the bunches of *Andropogon scoparius* in the bunchgrass prairie. Waukegan, Illinois.

acting as an invader, may be strikingly different from the structures of the same plant after the successful invasion of the

association, of which it is a characteristic species, takes place. This would seem to indicate that such forms are responses to environment. Consequently their distinguishing characteristics are not characters of organization. If this were not so, such forms would hold valid claims to specific rank. Such modifications occur constantly, but only occasionally are they of important ecological significance. It may happen to several, and sometimes to all, of the species growing in a certain habitat. There need be no taxonomic relationship between the species so involved.

The modifications most frequently observed tend towards the conservation of water supply. These are observed on soils made up chiefly of sand and gravel. The plants themselves are usually smaller. They are frequently more pubescent than usual. The leaves are narrower, thicker, often rolled, and frequently assume positions of protection from the noonday sun. The root system is more extensively developed, the flowers and fruit, however, do not ordinarily exhibit noticeable differences from the ordinary type. There is frequently a tendency to bloom more freely unless the growing conditions are extremely severe.

PETALOSTEMUM PURPUREUM f. **arenarium** FORMA NOVA*

	<i>Petalostemum purpureum</i> (Prairie plant)	<i>Petalostemum purpureum</i> f. <i>arenarium</i>
Root	tap root	larger and more bulky tap root
Crown	composed of a few upright stems	composed of many (20-38) radiating stems
Stems	stout and upright	shorter, wiry, divaricate, <i>i. e.</i> , standing at an angle of less than 45° with the earth from the commencement of growth. When growing on little hillocks the stems project below the horizontal
Leaves	divaricate, lancolate-trifoliate	appressed, linear-trifoliate
Heads	cylindrical, larger	cylindrical, smaller relatively
Flowers and Fruit	no appreciable differences	

An ecologist meets with such a state of affairs quite frequently, and these extremely varying forms may occasionally be of such

* Planta caule procumbente ab initione, foliolis lineariis, arenariam incolat.

significance that they must be distinguished from the usual forms, in any critical discussion of the vegetation. For this reason they deserve a name. As a single condition produces similar variation, it seems most logical to apply the same term to the results of similar conditions. Accordingly I propose that the term "arenarius" be used to designate those forms of species of plants in which xerophytic adaptations are induced by growth in sand. I append a description of such a form which has come under my observation.

TYPE. (Gates 2922) growing in sandy soil in the *Andropogon scoparius* consocieties of the bunchgrass prairie at Waukegan, Lake County, Illinois, August 7, 1908.

PHOTOGRAPHS. Gates 163 (August 17, 1909) and Gates 347 (August 13, 1910), the latter of which accompanies this article as figure one.

Specimens may be consulted at the Herbarium of the University of Illinois, the Field Museum of Natural History in Chicago, (type) and the author's private herbarium.

A similar form of *Apocynum hypericifolium* was commented upon by Schaffner.* It may be termed *Apocynum hypericifolium* f. **arenarium**. Other such forms are under observation.

These forms are always easily recognized in the field, but herbarium specimens illustrating them are difficult to prepare. Consequently ordinary herbarium material, unless fully labeled does not furnish satisfactory data. This difficulty is in a large measure obviated by the use of the camera and the notebook in the field.

UNIVERSITY OF MICHIGAN.

THE BOTANICAL NAME OF THE WILD SAPODILLA

BY N. L. BRITTON

The wild sapodilla or wild dilly, recorded by different authors under various names, is of the genus *Mimusops*, and occurs in southern Florida and through the Bahama Archipelago from Abaco and Great Bahama to the Caicos Islands and Inagua.

*Ohio Naturalist 10: 184. June 1910.